ularly in the discussion of phototropism, for which the experimental evidence is the most comprehensive.

Doubtless the portion of the book liable to excite the most general interest is that dealing with "Instincts" and "Memory images and tropisms." The author's views on these topics, now well known, are here incisively restated, and on some points extended. It is held that the preservative instincts are tropisms; and that the "problem of free will" is essentially solved through recognition of the orienting influence of memory images—which, being in man multitudinous, render impossible the prediction of individual behavior. The orienting powers of memory images afford an inviting topic for research, and one as yet very inadequately explored.

Two directions in which the results of tropistic analysis are of use to the naturalist are not so fully developed as one might wish: the value of determinate behavior in animals as a starting point for the experimental investigation of irritability, and the significance of the physical viewpoint for the analysis of organic phenomena as actually seen in nature. The limitations of space, however, have compelled great brevity of treatment. Nevertheless, the reader of this book should succeed in gaining fast hold of the conception that mere complexity is no bar to ultimate clarity of understanding in these matters; and should, in addition, acquire a healthy distrust toward the indiscriminate application of "laboratory results" to field conditions. The tropism doctrine, in other words, is in no sense an artificial simplification of "animal behavior." In this connection, specifically, the book will be particularly valuable as an introductory manual for students. To the investigator, already familiar with these ideas (it is to be presumed, but not in all instances correctly), the book has less new material to offer.

A bibliography of some 554 entries, not very well arranged and comprising some repetitions, together with a brief index of two and a quarter pages, complete the book. It is stated, rather bluntly, that the bibliography intentionally excludes "controversial and amateurish publications," and to that extent it should prove a useful guide. The citations are less complete for the years since 1911 than for the preceding period. No attempt has been made to critically discuss the contents of the publications listed, which is in many respects a blessing; for it is as a unitary presentation of the author's views that the monograph will be read with interest by all workers in this field.

W. J. CROZIER

UNIVERSITY OF ILLINOIS,
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THE GEOLOGICAL SOCIETY OF AMERICA

THE thirty-first annual meeting of the Geological Society of America was held in the rooms of the Department of Geology, Johns Hopkins University, Baltimore, Md., on Friday and Saturday, December 27–28, 1918, under the presidency of Dr. Whitman Cross of the United States Geological Survey.

The following program was presented:

Geology as a basis of citizenship: JOSEPH POGUE. (Read by title.)

Sources of and tendencies in American geology: JOSEPH BARRELL.

Geology as a synthetic science: WARREN D. SMITH. (Read by title.)

The United States Geological Survey as a civic institution during the war: SIDNEY PAIGE.

The military contribution of civilian engineers: GEORGE OTIS SMITH.

Presentation of geological information for engineering purposes: T. WAYLAND VAUGHAN.

Engineering geology in and after the war: CHARLES P. BERKEY.

Geology in the Students Army Training Corps: HERBERT E. GREGORY.

Cooperation in geological instruction: HERBERT E. GREGORY.

Map making, map reading and physiography in the training of men for the army and navy: WALLACE W. ATWOOD.

War work by the department of geology at the University of Oregon: WARREN D. SMITH. (Read by title.)

Recent earthquakes of Porto Rico: HARRY F. REID and STEPHEN W. TABER.

Structure of the Pacific ranges of California: BAILEY WILLIS.

Migration of geo-synclines: AMADEUS W. GRABAU.

Geotectonic adaptation through retardation of the earth's rotation: CHARLES R. KEYES. (Read by title.)

Late Mississippian orogenic movements in North America: FRANCIS M. VAN TUYL and RAYMOND C. MOORE. (Read by title.)

Post-glacial uplift of the New England coastal region: HERMAN L. FAIRCHILD. (Read by title.)

Topographic features of the Hudson Valley and the question of post-glacial marine waters in the Hudson-Champlain Valley: JAMES H. STOLLER.

Subterranean "chalk-streams" of northern France: EDWARD MOORE BURWASH. (Read by title.)

The relative efficiency of normative and modal classifications of igneous rocks: EDWARD B. MATHEWS.

Pegmatite, silexite and aplite dikes of northern New York: WILLIAM J. MILLER.

Magnetic iron ore deposits of Clinton County, New York: WILLIAM J. MILLER.

High grade clays of the United States: H. RIES.

Occurrence and origin of white clays at Saylorsburg, Monroe County, Pa.: F. B. PECK. (Read by title.)

Oil geology in relation to valuation: RALPH ARNOLD. (Read by title.)

Rock products and the war: G. F. LOUGHLIN.

Manganese ore as a war mineral: D. F. HEWETT.

World view of mineral wealth: JOSEPH B. UMPLEBY.

Internationalization of mineral resources: C. K. LEITH.

Commercial control of the mineral resources of the world: JOSIAH E. SPURR.

The economic limits to domestic independence in minerals: GEORGE O. SMITH.

Imperial Mineral Resources Bureau, London, England: WILLET G. MILLER. (Read by title.)

Some problems of international readjustment of mineral supplies as indicated in recent foreign literature: ELEANORA F. BLISS. (Introduced by C. K. Leith.)

War time development of the optical industry: F. E. WRIGHT.

Geologic and present climates: MARSDEN MANSON. (Introduced by E. O. Hovey.) (Read by title.)

Conditions of deposition of some Tertiary petroliferous sediments: AMADEUS W. GRABAU. (Read by title.)

Phosphate rock an economic army: R. W. STONE.

Prevailing stratigraphic relationships of the bedded phosphate deposits of Europe, North Africa and North America: AMADEUS W. GRABAU. (Read by title.)

Principles in the determination of boundaries: A. P. BRIGHAM.

Geographic descriptions of army cantonments and of United States boundary regions: M. R. CAMPBELL. (Read by title.)

The Signal Corps school of meteorology: OLIVER L. FASSIG. (Introduced by N. M. Fenneman.)

The American topographer in the rôle of artillery orientation officer: F. E. MATTHES.

A method of aerial topographic mapping: FRED H. MOFFIT.

Mexican petroleum and the war: E. W. SHAW. (Read by title.)

American mapping in France: GLENN S. SMITH.

Military mapping—a plane table: ALAN BATEMAN. (Read by title.)

The sand chrome deposits of Maryland: JOSEPH T. SINGEWALD, JR.

The Cartersville potash slates, their economic relation to chemical and industrial post-war development: T. POOLE MAYNARD. (Read by title.)

The anticlinal theory as applied to some quicksilver deposits: JOHAN A. UDDEN.

Crystalline graphite deposits of Alabama: WILLIAM F. PROUTY. (Read by title.)

Evidence as to the age of the semi-crystalline and crystalline rocks: WILLIAM F. PROUTY. (Read by title.)

Contributions to the origin of dolomite: W. A. TARR. (Read by title.)

The magnesite industry: R. W. STONE.

Although the number in attendance at the meeting of the society was not as great as at some of the eastern meetings there were about one hundred and twenty-five members and guests registered. The papers presented were interesting and valuable, and the days were crowded with events.

Luncheon was secured each day, together with the American Association for the Advancement of Science and other affiliated societies, in the Machinery Hall of the university.

Friday evening was occupied with the subscription smoker at which was held a round table discussion, presided over by Professor Bailey Willis, on "Cooperation in Geological Instruction" led by Professor Herbert E. Gregory and participated in by Professors George F. Kay, Charles P. Berkey, J. C. Merriam and William M. Davis.

The annual dinner of the society held jointly with the Paleontological Society and the Association of American Geographers was held, under the chairmanship of President Whitman Cross, at the Southern Hotel on the evening of Saturday. Ad-

dresses were made by Professor Merriam, Dr. Henry M. Ami and Professor William M. Davis. The evening was closed with the reading of the presidential address by Dr. Cross, entitled "Geology in the War and After," and followed by the address of the retiring vice-president of Section E of the American Association for the Advancement of Science, George H. Perkins, entitled "Physiography of Vermont."

The officers for the ensuing year, beginning at the close of the Baltimore meeting, are as follows:

President—J. C. Merriam.

Vice-presidents—R. A. Penrose, Jr., Herbert E. Gregory, Robert T. Jackson.

Secretary—Edmund Otis Hovey.

Treasurer—Edward B. Mathews.

Editor—Joseph Stanley-Brown.

Councilors, 1919–1921—William S. Bayley, Eugene W. Shaw.

Edmund Otis Hovey,
Secretary

THE AMERICAN PHYTOPATHOLOGICAL SOCIETY

The tenth annual meeting of the society was held in Gilman Hall, Johns Hopkins University, Baltimore, Md., December 23–28, 1918, in affiliation with the American Association for the Advancement of Science and the Botanical Society of America.

About fifty members were present. The program was devoted chiefly to project conferences and reports of the War Emergency Board, accounts of which will be distributed separately. Sixteen papers were presented at the regular sessions, abstracts of these appeared in the January number of *Phytopathology*. Twenty-nine new members were elected.

Joint sessions were held with Section G of the American Association for the Advancement of Science and also with the Botanical Society of America.

The followng officers were elected:

President—C. L. Shear, U. S. Department of Agriculture, Washington, D. C.

Vice-president—I. E. Melhus, Iowa State College, Ames, Iowa.

Secretary-treasurer—G. R. Lyman, U. S. Department of Agriculture, Washington, D. C.

Councilor for two years—Donald Reddick, Cornell University, Ithaca, New York.

Associate Editors for three years—Geo. L. Peltier, Agricultural Experiment Station, Auburn, Alabama; F. D. Heald, Agricultural Experiment Station, Pullman, Washington; J. E. Howitt, Ontario Agricultural College, Guelph, Ontario, Canada, and J. B. S. Norton, Maryland State College, College Park, Maryland.

Business Manager of Phytopathology—G. R. Lyman.

The society decided to hold its next annual meeting at St. Louis, Mo., in conjunction with the American Association for the Advancement of Science, December 29, 1919, to January 3, 1920.

Besides the papers presented at the War Emergency Board Conferences the following were read Saturday, December 28:

The Physoderma disease of corn: W. W. Tisdale.

Macrosporium solani on tomato fruit: Jos. Rosenbaum.

Notes on the rusts of the Piñon pines: Ellsworth Bethel, N. Rex Hunt.

Hot water seed treatment for blackleg of cabbage: J. B. S. Norton.

Fungi which decay weaveshed roofs (with lantern): R. J. Blair.

Resistance in the American chestnut to the Endothia canker (with lantern): A. H. Graves.

Investigations of white pine blister rust, 1918: Perley Spaulding.

Isolation of fungi from manufactured sugars: Nicholas Kopeloff.

On Wednesday evening, December 25, there was a dinner and a special program in celebration of the tenth anniversary of the organization of the society. The following papers were presented:

Our journal, "Phytopathology": L. R. Jones.

The first decade of the society: C. L. Shear.

The reading of these papers was followed by a general discussion of society problems and relations which proved interesting and valuable.

C. L. Shear,
Secretary-Treasurer

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